Shropshire Botanical Society

Newsletter

Autumn 2020

Shropshire Botanical Society Newsletter No. 41

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Past copies of the newsletter are available as pdfs from the Shropshire Botanical Society website: http://www.shropshirebotany.org.uk

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Front Cover:

Green Hellebore *Helleborus viridis*
(photo by Kate Thorne)

Our thanks to the Shropshire Wildlife Trust and the Field Studies Council for their generous support of our society. Both organisations support the work of the society in recognition of the importance of the contribution we make to understanding Shropshire botany.

Society News

Hilary Wallace

Welcome to the 2020 Autumn Newsletter following a most extraordinary summer with all our group activities cancelled and restrictions still in place for the foreseeable future. Despite this 2020 has proved to be a bumper year for botanical records in VC40 and Alex Lockton provides a summary of the main contributions.

Although we had no formal field meetings many members took advantage of the early lockdown, to explore their home areas. Some of your findings we've already shared on the Shropshire Botanical Society website and Facebook page, but in this edition, Chris Walker explores the weeds of his garden and Ruth Dawes has produced an imaginative 'rainbow' of plants in a pandemic.

We have another update from Liam Taylor on the activities of Caring for God's Acre and Fiona Gomersall carries on the theme of botanical visions for the county. It is exciting to have two new contributors to the newsletter, both with a slightly watery theme. Kirsty Brown, Senior River Projects Officer, Shropshire Wildlife Trust presents an article on Invasive Non-Native Species: Himalayan Balsam and rust fungus biocontrol, whilst Lisa Barlow, from the Severn Rivers Trust, looks at Trees and River Restoration and their plans to plant 50,000 trees this winter.

Finally, in Botanical Society tradition, we conclude with two articles on tricky taxa. John Handley has been grappling with grasses in Holy Trinity Church burial ground whilst Martin Godfrey continues his series on fern identification.

We have finally caught up with the latest accepted nomenclature for vascular plants and will be adopting Stace, 4th Edition in this and future editions of the newsletter. There is a comprehensive pdf file produced by BSBI available on their web page: Stace Edition 4: Changes

Society meetings

AGM Sat 26th September 2020 by Zoom

The AGM was held as a virtual meeting, a first for the Society, although the Committee have been having meetings online since April. Sue kicked off with a roundup of Society activity to the 20 participants, then we swiftly dealt with committee business and it is all change:

- John handed over the baton of Chair to Mags
- Martin Godfrey agreed to take the position of Membership Secretary which Sue and Mags have been covering between them for the past 12 months
- I (Hilary) am stepping down as Newsletter commissioning editor after this edition, and Andrew Perry is taking over this role, with the continued assistance of Gordon Leel who lays out all the articles and pictures into a coherent publication.

Mark Duffell then gave an interesting presentation "What's in a Name" in which he set the history of taxonomy and nomenclature and illustrated how plants and other organisms have been categorised over time. There was audience participation to demonstrate their knowledge – or their wild guesses! He brought the topic up to date with a section on current reclassifications based on DNA proven relationships and justified the name changes which some of us find hard to adapt to! This was a lovely mixture of biography, botany, taxonomy, linguistics and quirky anecdotes and made an entertaining and informative talk.

BSBI New Year Plant Hunt

There won't be any organised outings but you can follow the BSBI guidelines. The NYPH initiative is providing some interesting data on flowering trends at this time of year and more details can be found on the BSBI webpages: NYPH How to take part. If you do your own plant spotting walk/ outdoor exercise, we are inviting you to share photos of your finds at the winter social (more details below).

Winter Social Saturday 16th January 2021, 2pm – 4pm, by Zoom

Bring your own cake, mulled wine or coffee and join in the fun on-line:

We will have a festive quiz, a New Year Plant Hunt (NYPH) Round Up with photos of finds and experiences from members, answers to the Christmas Challenge Crossword and prize giving, plus a plant ID surgery.

Please send in your NYPH photos of top finds, where you were and who with, prior to Saturday 16th when we don our party hats, wheel out the left over mincepies and have a glass of mulled wine ready. Email to: shropbotsoc@gmail.com

You will all receive an email with the Zoom invite nearer the time. If you have not tried virtual meet ups before, give it a go, it is easier and more fun than you might think and there isn't much option for meeting up at the moment!

Online Flora Database Update

The website that provided access to the Shropshire botanical records, which are diligently curated by Alex Lockton, has been much missed by many recorders within the county. The committee approved a proposal to commission Joe Collins to produce a design which will allow us to obtain tenders from website developers. This will replace the original website and once again set the highest standards in the country in providing access to biological data. This is a technical project that takes time to bring to fruition but perseverance from the project architect and a subcommittee composed of Dan Wrench, Mags Cousins and John Handley means that the results of everyone's hard work should be seen in 2021.

Joe Collins provided an online presentation to the committee in early September and is still working on some elements of the architecture. Once the design is approved by the committee several companies have been identified as being able to tender for the contract to undertake the development of the website.

The new design will allow Shropshire records to be downloaded directly from the National Biodiversity Network (NBN Atlas) database quickly in the field as well as at a desktop. It will also facilitate some of the sorting which will hopefully, make it easier to use and more informative.

Field Meetings 2021

The field meetings programme for 2020 was suspended due to Covid-19 but we are hoping to roll out the entire programme in 2021 instead! It will look something like this:

May

Earl's Hill. Meet at 11:00 am in the car park at SJ409057. This will be the perfect time of year to see the wonderful woodland flowers plus the spring ephemerals in the acid grassland. The walk will have some steep climbs and spectacular views. For further information about the meeting please contact John Handley, 07507 054695, johnhandley11@gmail.com

Brook Vessons Farm and Paulith Bank. Meet at 10:00 am in the farm yard at SJ395012. Parking spaces are limited so please car share where possible. For further information about the meeting please contact Dan Wrench, 07718391794, danwrench@gmail.com

June

Muxton Marsh. Meet at 11:00 am in Woodbine Close. This is a cul-de-sac off Marshbrook Way, Muxton at SJ7146 1351. Park between drive ways as discreetly as possible. For further information about the meeting please contact Penny Wysome, 01952 242617, pennywysome@yahoo.com

Smiling Tree Farm, Chapel Lawn, Cardoc and Bryncambric. Meet at 11:00 am in the farm yard at SO 3162 7582. Please car share where possible. You will see meadows, streamside vegetation, and upland acid grassland / heath. For further information about the meeting please contact Mags Cousins, 07873 532681, mags@bagbatch.co.uk

July

Clive Churchyard and Grinshill. Meet at 10:00 am at Clive Church at SJ5146 2408. Please car share where possible as there are only a few parking places alongside Drawwell Street, just north of the Church. The access will be very easy in the churchyard for the first part of the walk and moderate going for the walk up Grinshill. It will be a mix of recording and training. Attending for just an hour or two in the churchyard is fine. For further information about the meeting please contact Andrew Perry, andrew.perrynt@gmail.com

Recording progress

Alex Lockton

2020 has proved to be a bumper year for botanical recording in Shropshire. Recently we have struggled to get many records, with our target of 10,000 not having been achieved sometimes. On the plus side, this has given us an opportunity to work on some of the lower priority datasets from the past, but the number of interesting records acquired from that is small.

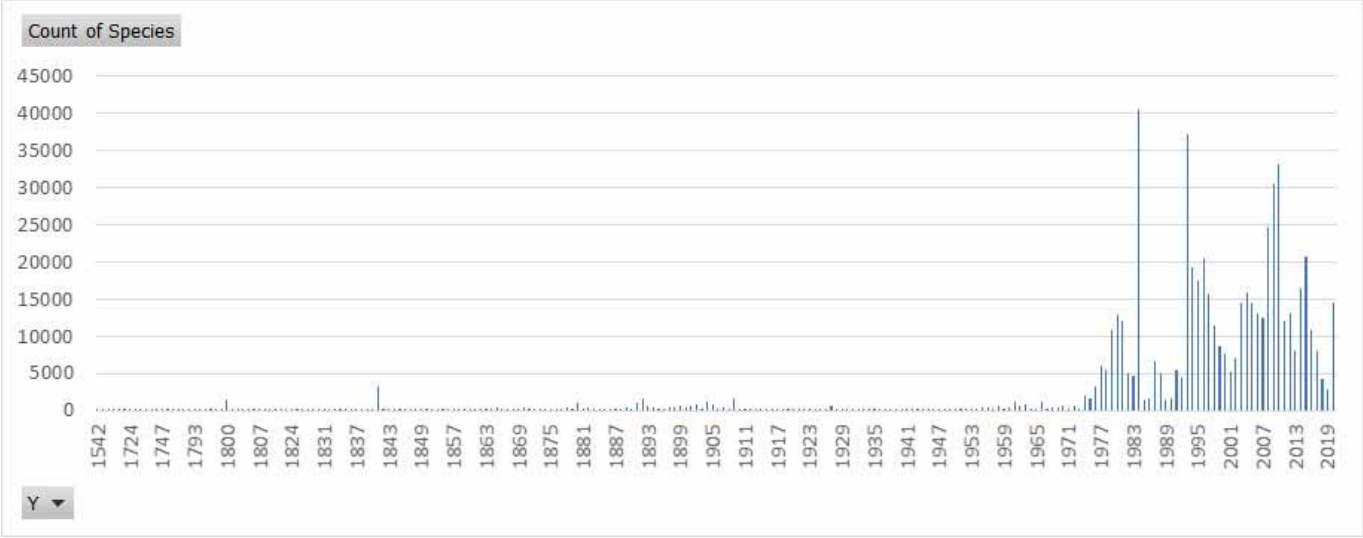
This year we decided to offer some small incentives to people to do more recording. A bursary of £500 each was awarded to Jon Shanklin and John Martin to 'bash' some monads. The aim of this is to get a decent number of species recorded in the tetrad in one year, which should allow us to detect change in a similar way to the BSBI's Monitoring Scheme. This, we feel, is far more useful than just getting a few random records from around the county, which is good for finding out the basic distribution of a plant, but not for much more than that.

So far, we have been rewarded with nearly 10,000 records and there are more to come. In addition to that, Kate Thorne has sent in more than 4,000 and various other people have contributed 1,000 more. I notice that iRecord has about 5,000 for the county already, and I plan to incorporate those at the end of the year. Given that it often takes a year or two for record cards to make their way to us, it seems likely that we will end up with over 20,000 for the whole year. This compares well with any recording period in the last 500 years.

New species and important finds remain gratifyingly few, so our recent Flora remains fairly accurate five years after publication. I do update the species accounts with name changes, significant new finds and additional species. Most of the latter are of course neophytes – garden escapes that have become more-or-less established in the wild. I do not include garden plants that have been found in gardens, even if self-sown. You can get a copy of the current species accounts from members of the committee.

All our data remains fully available to anyone who wants it. The easiest source is probably the NBN Atlas, which allows various types of searches and downloads. Unfortunately, it lacks a few of our species which have new, Stace 4, names, because the NBN does not yet recognise them; but this will undoubtedly be resolved before too long. Other ways to get the data are from the BSBI, the Shropshire Ecological Data Network website, or just by asking a member of the committee.

If any members want to do any recording, the easiest way is now to input your records to iRecord, online. Using Mapmate or an Excel spreadsheet are acceptable alternatives.



Flora of a Country Garden

Chris Walker

I drafted most of the article which follows before the Coronavirus outbreak, but since writing the bulk of it I have, like most people, been confined to my garden and the places I can walk to easily. So in the absence of trips to botanically-exciting places, it is likely that many of us are giving more attention to things that we have hitherto considered mundane, like the wild(ish) plants that occur in our gardens.

The garden of which I write is situated about 7 km south of Shrewsbury, on a gentle ridge of glacial sand and gravel (probably an esker). The front garden is at the top of the ridge and more or less level, but the back garden slopes gently eastwards. The house was built in 1926, on the edge of parkland north of Condover Hall, and there are three mature trees in the front garden (two Scots pines and a common oak) which were probably originally parkland trees. Veteran oaks which were present in the fields behind (east of) the house and garden were removed about 20 years ago. Ironically, the trees in gardens in this village are protected by Tree Preservation Orders, but no such designation applies to the trees in the surrounding farmland. Our house was originally built as an estate worker's cottage for the Condover Hall estate, in an age when a large garden was an asset in which working men could grow vegetables in whatever spare time they had – in the absence of distractions like television and the internet. So I conclude that parts of the garden, at least, have been cultivated for more than 90 years. I have cultivated it for 44 years of that time, and apart from a brief flirtation with glyphosate many years ago, I have gardened organically.

Our garden has always been weedy. The compost heap does not get hot enough to kill weed seeds, and I am too busy doing other things to weed meticulously. We have a selection of annual and perennial weeds, and some plants which I have grown at some time in the past now act as weeds. My policy towards many weeds is a tolerant one, but there are others which I treat less kindly. For example, I always leave a plant or two of Common Mullein *Verbascum thapsus* in the vegetable garden, but do my best to get rid of Field Horsetail *Equisetum arvense*, Hedge Bindweed *Calystegia sepium* and Couch Grass *Elytrigia repens*, although I know that realistically the best I can do is keep these under control.

As you might expect, the weed flora of the garden consists of a mixture of native and introduced species, some of the latter being residents of long-standing (archaeophytes). In discussing the status of these plants I have used the fourth edition of Clive Stace's New Flora of the British Isles. Nomenclature also follows this flora. This short article doesn't pretend to present a comprehensive list – I have picked out species which I find interesting for one reason or another.

We have quite a lot of the expected annual weeds, such as Scarlet Pimpernel, which has recently been reclassified as a member of the genus *Lysimachia;* I find it difficult not to think of it as *Anagallis arvensis*. This species is considered to be native, as is Fool's-parsley *Aethusa cynapium*. Common Field Speedwell *Veronica persica* is apparently a relatively recent arrival (1825), but Shepherd's-purse *Capsella bursa-pastoris,* Sun Spurge *Euphorbia helioscopa* and Petty Spurge *E. peplus* are archaeophytes (not native but present since medieval times). We have both nettles, the perennial and native *Urtica dioica* and the probable archaeophyte *U. urens.*

I have already mentioned Hedge Bindweed *Calystegia sepium*, also known as bell-bine, or locally, barbine (although the Shropshire Word Book of 1879 suggests this name for field bindweed). Its tangled fleshy roots wind their way into the bases of perennials such as raspberry canes. In hedgerows near here the introduced *C. silvatica* also occurs, but all ours seems to be the native species; though I try to weed it out before it flowers, so haven't checked all of it.

The smaller, pink Field Bindweed *Convolvulus arvensis* occurs throughout our vegetable patch. It is almost impossible to eradicate because, like its bigger cousin, it regenerates from bits of root left in the soil after cultivation.

While on the subject of climbing plants, it is worth mentioning White Bryony *Bryonia dioica*, which also grows in our garden, and which I was

surprised to see here. Stace says it occurs on "well-drained base-rich soils", which I suppose is a good description of our back garden. It has a large fleshy root, and has popularly been identified as mandrake (and Grigson gives mandrake as a Shropshire name for White Bryony), a plant with magical and medicinal properties (Allen & Hatfield 2004). It is acrid and poisonous, though I've no experience of these attributes!

Problematical perennials include Couch Grass *Elymus repens*, which in the time I've known it has undergone a confusing number of name changes; it will always be *Agropyron* to me. We also have Field Horsetail *Equisetum arvense* (often, erroneously, called mare's-tail locally), which has crept in from the garden to the north of us during the time we've been here. They say that the only remedy for horsetail in the garden is to move house – but we're still here. It is difficult to control, as the rhizomes are dark in colour, very flexible, and occur deep in the soil (compared with couch and most other perennial weeds). As with the bindweeds, I try to eradicate these in the vegetable garden, but know that I have no chance of total success.

We have two fumitories (Papaveraceae), Common Fumitory *Fumaria officinalis* which Stace describes as an archaeophyte-colonist, and White Ramping-fumitory *F. capreolata* which is apparently native and also occurs in hedgerows in this area. These are both annuals. I am tolerant of them, as I find them attractive plants.

A relic from a former occupant is Evening Primrose, which produces big rosettes in its first year, flowering in the second. Our plant seems to be the large-flowered species *Oenothera glazioviana*. It is interesting that this species has survived without encouragement for more than forty years.

Another alien which pops up less frequently than *Oenothera* is Thorn-apple *Datura stramonium,* I first saw this in the hot summer of 1976, our first year here. If the summer is warm enough, there are usually one or two plants among the vegetables – two this year, among other annual weeds. Who introduced this and why I don't know, and perhaps it is an accidental by-product of bird-seed. But it must have persistent seeds which lie dormant until conditions are suitable for it.

Both of the above species are originally from north America. Borage *Borago officinalis* is an archaeophyte from southern Europe. We brought this species here ourselves, growing it for its vibrant blue flowers and its attractiveness to bees. Now it comes up in various parts of the vegetable garden, decades after we introduced it, and we leave a few plants each year. Opium Poppy *Papaver somniferum,* on the other hand, pre-dates our arrival here, but persists.

I have already mentioned Common Mullein. This is a welcome weed, though each plant that I spare takes up a lot of space. "Our" plants are always attacked by the attractive pale blue, black and yellow caterpillars of the Mullein Moth *Cucullia verbasci,* which seems to be another good reason for allowing a few plants to grow to maturity.

I said at the beginning that this would not be an exhaustive list, and this article is already expanding in length. I would just like to mention two species that are more commonly associated with woods and hedgerows; Wood Avens *Geum urbanum*, which the Flora and Vegetation of Shropshire says can be a persistent weed, and Cuckoo-pint *Arum maculatum* in the shady areas among shrubs at the bottom of the garden. And I will finish with that malodorous plant Herb Robert, which had two delightful dialect names in Shropshire – dragon's-blood and squinter-pip (mentioned by Grigson and confirmed by Jackson). I wonder if any contemporary botanists have come across either of these names?

Bibliography

David E Allen and Gabrielle Hatfield 2004; *Medicinal Plants in Folk Tradition*

Geoffrey Grigson 1955; *The Englishman's Flora*

Georgina Jackson 1879; *A Shropshire Word Book*

Clive Stace *New Flora of the British Isles*, fourth edition

Alex Lockton and Sarah Whild; *Flora and Vegetation of Shropshire.*

Plants in a Pandemic

Ruth Dawes

Coronavirus Lockdown from 24th March meant that I walked from home much more. Amazing what new plants you spot on local verges, even when you have lived in the same spot for 40 years.

The spring plants on the Oswestry Carboniferous Limestone uplands were a fine show; Primrose *Primula vulgaris*, Cowslip *Primula veris*, Wood Anemone *Anemone nemorosa* and Early Purple-orchid *Orchis mascula* were particularly long lasting in April and May. The latter was in four figures in scrub at Llanymynech. A report from owners of the Frog Orchid *Coeloglossum viride* meadows at Pant was uplifting – small plants, but almost 200 counted, from mid-April onwards, the earliest flowering and largest numbers ever recorded on site, but an early finish by about mid-May. Sadly, their Greater Butterfly-orchids *Platanthera chlorantha* did not survive so well in this frost pocket. After a very promising start, 50% of the plants succumbed to a swingeing frost on 14th May and never recovered.

I was delighted to discover new sites for some of my favourite flowers – carpets of Herb-Paris *Paris quadrifolia* in a local wood and a patch of Alternate-leaved Golden-saxifrage *Chrysosplenium alternifolium* on a none too wet verge. Again, the Green-winged Orchids *Anacamptis morio* on a dry slope in Nantmawr were dwarf in stature, but there in good numbers in their purple glory. It was really nice to visit a wetland site and see Butterwort *Pinguicula vulgaris* flowering profusely – heart-warming to see a good display of this declining species. The sunniest April and then the driest May on record ended with plants being stunted and stressed, but were an untold blessing for humans. On a walk along a track close to Rhydycroesau on 28th May I was pleased to see some very professional dry stone wall repair and restoration had been done. That was until I realised that all the locally scarce and decreasing Hound's-tongue *Cynoglossum officinale* had been removed to facilitate the work. As usual, the disturbed ground had become home to a forest of Spear Thistle *Cirsium vulgare*. I hoped the *Cynoglossum* was still there in the seed bank. In despair I looked through an open gate and was relieved to find plenty of plants still there the other side of the wall in a field.

Pyramidal Orchids *Anacamptis pyramidalis* had a good year too, putting on abundant displays in open, dry, wet and shady areas. Conditions did not suit Bee Orchid *Ophrys apifera* and Common-spotted Orchid *Dactylorhiza fuchsii* so well. They were few in number especially where it was dry and soon withered. Sweeney Fen was exceptionally beautiful at the end of June with Marsh Helleborine *Epipactis palustris* and Marsh Fragrant-orchids *Gymnadenia densiflora* out in abundance at this early date. How lucky botanists are to use all their senses – the colour and scent were amazing all across the site. I had to smile at two ramblers who had missed a footpath the other side the hedge and were grumpily picking their way through this "awful bog."

Sadly the Lesser Butterfly-orchids *Platanthera bifolia* seemed to have disappeared from Llynclys Common, but do jump up with glee and shout at me that I am wrong. I haven't seen them for several years.

I discovered two new local floriferous meadows in two days which brought gladness to my heart. Allan had spotted a colourful meadow in a hidden folded valley in Trefonen when he was monitoring curlews. I was very pleased to stroll along a footpath by a charming MG5 hay meadow with Yellow-rattle *Rhinanthus minor* and *Dactylorhiza fuchsii*, not to mention lovely views en route. Only two days later I was invited to see Jacky's meadow at Treflach, which turned out to be a few square metres of steep bank at the top of their large natural garden and orchard. Wow, *Anacamptis pyramidalis* in three figures, Bladder Campion *Silene vulgaris* and locally scarce Hedge Bedstraw *Galium album*. Well that wasn't bad for a former haulier's yard. Nostalgically, I couldn't help remembering Marjorie Wainwright's descriptions

that many of Treflach's meadows were once like that.

At the beginning of July I rambled along a path I had never investigated before taking me from Sweeney Fen towards Dummy's Wood. Lo and behold, yet another thickly herb-rich meadow with abundant *Anacamptis pyramidalis*, *Rhinanthus minor*, *Primula veris* in seed and many Rough Hawkbit *Leontodon hispidus* flowers. Investigations proved this one to be David's Meadow, which he had purchased in memory of his late wife, who died too young. Close to a working quarry, on thin limestone soil, the flowers were flourishing under his management regime of cutting late and grazing appropriately.

Another of Allan's finds on a local working party was Pirko's Meadow hidden away at Nantmawr in July where they pulled Ragwort *Jacobaea vulgaris*. He was impressed with the abundant hemi-parasitic annual, Red Bartsia *Odontites vernus,* and reported back that although they only had a few *Ophrys apifera* this year, in one exceptionally good year, they were in three figures. Well, how often do you see that?

August 4th was the earliest that Autumn Lady's-tresses *Spiranthes spiralis* had ever been recorded at Llanymynech Rocks Nature Reseve and it was lovely to see them widely scattered. Less welcome was the sight of the water board grassland on the border by the golf club, which had been recently scalped with the mower and the cuttings left on. I had previously helped to record 759 flowering spikes of *Spiranthes* there in 2011 with the then CCW. Oh dear, had to get my contacts on the case.

So, like in the 2020 pandemic, some died, some survived, some withered and struggled, some blasé species even flourished. Never have so many folks owed so much to the wonders of nature for their wellbeing. As I write this, lockdown threatens again. Keep walking, there is much to be seen in the winter – crops of acorns, chestnuts and walnuts are abundant this year. Plant some local acorns as a symbol of new life and faith that we will survive. Enjoy.

Trees and River Restoration – Severn Rivers Trust to plant 50,000 trees this winter

Lisa Barlow, Severn Rivers Trust

Trees play a crucial role in helping us to combat the climate and biodiversity crisis; and are hugely important in restoring river catchments. With government targets set to increase tree cover in the UK, Severn Rivers Trust are working to ensure planting is sensitive to priority habitats and the benefits for the river are maximised.

Severn Rivers Trust have plans to plant 50,000 trees this winter to protect the rivers Onny, Teme and Rea in Shropshire; the Alne in Worcestershire and the Cain upstream in Powys. These trees will be planted to slow flood water, improve biodiversity, protect riverbanks from erosion, create shade for fish and other wildlife to thrive, reduce pollution run-off and sequester carbon. Our partners the Woodland Trust provide native trees suitable for riparian planting, hedgerow restoration, shelter belts and woodland creation along with the necessary tree protection.

Ed Noyes, Fisheries Officer for Severn Rivers Trust manages the partnership with the Woodland Trust in England. He highlights the threats to declining Atlantic Salmon populations posed by climate change and river habitat loss and advocates for sensitive riparian tree management in mitigating these impacts.

There are also many benefits of planting trees in the right places to a network of farm businesses; soil protection, in-field shelter for stock, and restoration of stock proof hedges to improve biosecurity between farms. The Severn Rivers Trust Land Management Team assists farmers with grants for fencing and planting, advises on species mixes and provide a point of contact for enquiries. While farmers are planting the trees themselves, Severn Rivers Trust handle the deliveries and heel in the trees ready at the farm to help planting run smoothly. Landowners sign maintenance agreements and tree care is built into our volunteering programme.

Where rivers have been fenced off to reduce poaching of the banks, we plant a mix of Common Alder, Downy Birch, Rowan, Aspen, Grey Willow, Goat Willow, Bird Cherry, Crab Apple, Hawthorn and Hazel. New woodlands are planted up with a mix of Ash, Silver Birch, Sessile Oak, Wild Cherry, Rowan, Blackthorn, Quickthorn, Hazel, Holly, Crab Apple, Dog Rose and Goat Willow.

Shelter belts and hedgerows are planted across the contours of hills, with a mix of Silver Birch, Sessile Oak, Wild Cherry, Rowan, Blackthorn, Elder, Quickthorn, Hazel, Holly, Crab Apple, Dog Rose, and Goat Willow.

Before planting can begin, Severn Rivers Trust liaise with statutory agencies and undertake a desk-based mapping assessment to prioritise planting and flag up any constraints such as historical interest or good quality grasslands. Planting densities are agreed taking into consideration flood risk and the type of planting.

Much of the planting relies on the hard work of a team of dedicated volunteers. We welcome volunteers from local community groups and are always happy to organise team building days with local businesses. More information on volunteering opportunities and team building days is available on our website www.severnriverstrust.com. Or get in touch by emailing lisabarlow@severnriverstrust.com.

This work is possible, thanks to the Water Environment Grant funded Reaction Project and three projects in the Wales region funded by the Sustainable Management Scheme administered by Welsh government: the Wye Ithon Severn Ecosystems (WISE), the Cain Valley Sustainable Land and Water Management Project, and the Nant Alan Land Management and Climate Resilience Project.

Photo thanks to Andy Green of the Cain Valley River Group.

Tree planting at the Brogan 2019 (Photo by Andy Green)

Wishes for improving botanical conservation in Shropshire

Fiona Gomersall

I was asked by John Handley to write an article on three things I would want to change over the next 10 years to improve conservation in Shropshire. This is a big ask as what I wish for is complex and tied up with many other situations which need to change. Writing this article under partial lockdown due to Covid-19 though, has brought many of us hope that our isles and indeed the world have an opportunity to bring about radical change to the way we live in order to tackle species loss and climate chaos.

I, like many ecologists dream of a return to a more semi-natural Shropshire – the one I thought I was moving to 25 years ago. I thought I understood that the county had one of the less 'improved' landscapes in the UK and was naïve to believe this as, like everywhere else, most of Shropshire's wetlands had already been drained and the unimproved grasslands ploughed, encouraged by Government grants on offer in the 1970s.

The decline and loss of species and habitats kickstarted the countywide habitat survey of Shropshire and the publication of the 'Ecological Flora of the Shropshire Region', Sinker *et al.* Later, John Tucker, working as Conservation Officer at Shropshire Wildlife Trust (SWT) started to notice a loss and decline of local wildlife sites (LWS) and wrote his publication, 'Losing Ground', on the disappearance and decline of these prime habitats.

Tragically decline of species and habitats has continued. Living near Bury Ditches from 1995 to 2015, I witnessed locally the drastic decline in lapwing numbers. I also noticed a big increase in road traffic accompanied by the eutrophication and trashing of roadside verges, so that a diversity of quite common species was replaced by a monoculture of False Oat-grass *Arrhenatherum elatius* and Hogweed *Heracleum sphondylium*.

We can't turn back the clock but we can attempt to restore lost habitats, create new and at least hold on to the best sites still existing like the Long Mynd, the Stiperstones and the 700 or so LWS in Shropshire.

My three asks are: 1) Strengthen environmental legislation and regulation to protect semi-natural sites. 2) Ensure a fully-functioning Nature Recovery Network throughout Shropshire linking the protected 'core' sites - the SSSIs and NNRs. 3) Improve environmental education at all levels of learning.

Stapeley Hill – a rich local wildlife site (LWS)

In my years as Conservation Officer at SWT I too saw a decline in LWS. I surveyed many that had lost the criteria that had them adopted in the 1980s. These mostly grassland sites had been ploughed, re-seeded and fertilised or neglected so that fragile species were out-competed by tall grasses and scrub. In 2010 for example, I surveyed the LWSs surrounding Catherton Common and found that 50% had been lost: turned into lawns, ploughed-up, drained, fertilised or overgrazed by horses and sheep. Nearby SSSI were suffering a similar fate. LWS have no statutory protection and so landowners can virtually treat the land as they wish. The loss of sites around Catherton was mostly a result of ignorance or the need to increase horse pasture. The original inhabitants had sold up and newcomers, not knowing that they had inherited something special, had proceeded to destroy it. For many though, the need for horse grazing pasture was stronger than the desire to nurture a species-rich meadow. Distressingly I witnessed further decline following those 2010 surveys. The LWS Botany Bay had already suffered the creation of a horse manège and grassland improvement but new owners then drained the remaining wildflower meadow that had been full of Quaking-grass *Briza media*, marsh orchids *Dactylorhiza spp*. and Devil's-bit Scabious *Succisa pratensis*.

The Environmental Impact Assessment (EIA) Regulations 2011, were brought in to protect vulnerable grasslands like Botany Bay, and Pant y Lidan LWS in the Clun Forest, which was part-ploughed following the end of the Environmentally Sensitive Area (ESA) farm subsidy. It is a travesty that this is common practice amongst many landowners following the close of a land management scheme. Land that has gradually reverted over the 10 or so years of the scheme to a more natural state, with the return of 'wild' grasses and some diversity is then ploughed up to apparently increase productivity. The land is then entered into a new scheme and the owner receives further subsidies for grassland restoration. Although the owner of Pant y Lidan, like all landowners would have been alerted to the relevant EIA paperwork, he like many others who breached the regulations, seemed unaware of the rules when challenged. The EIA is now weakened so that instead of a Natural England ecologist assessing the grassland following a request to plough, drain or fertilise, the owner is required to carry out the assessment themselves. Few that I have met (or their land agents) have the habitat assessment skills necessary for identifying unimproved grassland.

The UK agricultural sector is responsible for 88% of ammonia emissions which not only seriously impact on human health but have a destructive impact on semi-natural habitats. Intensively reared cattle, pigs and poultry are responsible for most of these ammonia emissions. The number of intensive poultry units (IPU) in the three counties of Shropshire, Herefordshire and Powys has increased exponentially in recent years so that on any one day there are now around 47 million birds. Large units require permits and have stringent regulations around ammonia emissions but any unit with under 40,000 birds is not regulated and there are plenty of these. In the Shropshire Hills AONB alone there are around 40 IPU, with many more throughout the county. Ammonia has a substantial impact at a local level, so that emissions at ground level lead to rapid deposition with acute effects on small, isolated nature reserves like Ruewood SSSI near Wem. APIS is a website where atmospheric ammonia can be measured for all SSSIs and SACs in the UK. In Shropshire, the critical threshold for vegetation damage by ammonia is exceeded on all SSSIs. Heathland SSSIs and those with sensitive lichens and bryophytes like Rhos Fiddle in the Clun Forest are more vulnerable. Lichens are sensitive to 0.1ug/m^{-3} NH_3 and the levels of ammonia can be 100 times this around IPU, leading to direct deaths of sensitive lichens and bryophytes. In vascular plants ammonia enters leaf stomata and if uptake exceeds detoxification, ammonia accumulates interfering with cellular processes and poisoning the plant. Heather *Calluna vulgaris* in this case will suffer desiccation in winter, drought stress in

Lichens are especially sensitive to atmospheric ammonia

summer and is more susceptible to attack by pests and pathogens like Heather Beetle. In addition, excess ammonia increases nitrate concentration (through the nitrogen cycle) in soils which favours more competitive species like grasses so that on moorlands, mosses, lichens and ericoids are replaced by Purple Moor-grass *Molinia caerulea*, Rosebay Willowherb *Chamerion angustifolium* and Common Sorrel *Rumex acetosa*. Monitoring Catherton Common SSSI, I measured a significant increase in *Molinia* over the last few years.

In summary, there is an urgent need for statutory protection of LWS, large penalties for destruction of semi-natural habitats and a moratorium on planning permission for further IPUs accompanied by strict regulations for ammonia emissions from all farming practices.

2 The forthcoming Environment Bill lays down the foundation for Nature Recovery Networks (NRN) throughout England and various organisations have been making plans for how this will work. The Environment Bill is not yet through, nor the detail but if there is adequate funding for NRN development, our declining species and habitats could be on a road to recovery.

An NRN is a resilient and coherent ecological network which counteracts habitat loss, decline in its quality and fragmentation. In Shropshire, SWT and the Shropshire Hills AONB, along with partner organisations are amassing baseline data and writing plans. The idea of NRNs follows the Lawton Principle (Lawton 2010), which states that isolated SSSI and nature reserves, the core sites have to be made bigger and better and join up with other nature-rich sites. Complexity and dynamism with mosaics of rich habitat supporting diverse food webs will offer the best protection against factors like climate chaos.

A fully effective NRN requires core sites to be at least 5,000 to 12,000 hectares in size.

The National Trust's Stepping Stones main project objective to link the Stiperstones NNR with the Long Mynd SSSI is based on the Lawton Principle. The Mynd is around 5400 ha in area and the Stiperstones 588 ha. It would be unfeasible to 'naturalise' all farmland between these two core sites, but using LWS as stepping stones, the restoration of semi-natural grasslands and wetlands around and between these could form a network to both connect and expand the two core sites. If recovery is to work, 20% of the network will have to be semi-natural and evidence suggests that improving the permeability of such a 'matrix' is more important than providing physical corridors for wildlife dispersal. In addition, the core sites will need to be managed to maximise the survival of as many key species as possible

The plan for funding NRNs will be achieved mostly through the New Environmental Land Management Scheme (NELMS) where farmers are paid on a 'Public Money for Public Goods' basis. The public goods or 'natural capital' are the clean air, unpolluted water, healthy soils and the land which is most effective at absorbing carbon, alleviating flooding and supporting healthy populations of our native flora and fauna.

3 My last plea for change is in education. If the public does not value nature or understand the function of landscapes, they won't be prepared to pay for the necessary restoration and services that nature provides. Most readers will agree that there is an urgency to provide an education in natural history and conservation at all levels of education. If we understand how the natural environment functions to support all life on earth and we cherish the animals, plants and

Restoration of riparian habitat is needed to strengthen ecological networks

fungi that populate it, then we are more likely to protect them. If we are taught that our actions and everyday choices will directly or indirectly lead to the loss of much-loved species, then we may be prepared to behave differently.

Natural History is now as important as any other subject in the school curriculum and should be taught at every level in education. Knowledge of species, ecosystems and natural resources has to be ingrained in every young person so that even if a child doesn't develop a wonder at the natural world then they will at least be taught the importance of nature's role in daily living.

Natural History will need to be a part of teacher training and organisations like the Field Studies Council and the wildlife trusts will become ever more important in supporting schools. Sara Lanyon who many of you will know has been working passionately for both in Shropshire for years and has lately been instrumental in developing a Natural History GCSE.

We will need to go beyond this, to the agricultural colleges where it is urgent to have a much more integrated programme of learning. Topics like conservation, ecological function and natural flood management have to be linked to every aspect of farming, from managing grassland for dairy herds to improving arable productivity. Young farmers and countryside managers are leaving college with little understanding of ecological systems and how farming impacts on them. Food production must not compromise the health of our ecosystems. If we don't address this, then we will not only lose our wild spaces in Shropshire but we will be unable to sustain life on this planet.

Volunteers at work (Photo by Holly Jones)

Invasive Non-Native Species: Himalayan Balsam and rust fungus biocontrol

Kirsty Brown

Thanks to success in receiving funding via the Water Environment Grant, run by Natural England and the Environment Agency, Shropshire Wildlife Trust (SWT) have set up the Shropshire Invasive Non-Native Species Initiative (SINNSI) project this year, collaborating with a variety of stakeholders. The project website, with more details, is available here: https://www.shropshirewildlifetrust.org.uk/shropshire-invasive-non-native-species-initiative . Whilst much of the action on the ground for this project has to been postponed to 2021 due to coronavirus, Kirsty, Senior River Project Manager on the Rivers Team at SWT has been collaborating with the Centre for Agriculture and Bioscience International (CABI) scientists to facilitate release of a highly species-specific rust fungus biocontrol on small areas of the invasive non-native Himalayan Balsam, *Impatiens glandulifera* in Shropshire.

Himalayan Balsam is one of many invasive non-native plant species. These invasives can pose a threat to native habitats, cost the economy and affect human and animal health in the UK. For a full list of invasive non-native species and the latest information for the UK, please see: http://www.nonnativespecies.org/

Research has shown that Himalayan Balsam is not only affecting native flora by outcompeting them, and leaving riverbanks more prone to erosion during winter, but is also luring pollinators away, leaving native species less 'fit', for example see:

- Chittka, L., Schürkens, S. Successful invasion of a floral market. Nature 411, 653 (2001) available here: https://www.nature.com/articles/35079676 .

While the release of any rust fungus, especially from another country, can be cause for concern, CABI have undertaken extensive tests to meet UK rules and release of the rust fungus has been approved by DEFRA. In addition to an interesting video on YouTube showing CABI scientists searching for biocontrol agents in India

here: https://youtu.be/sk8dgh_h-34, a variety of research papers are available on the rust fungus, including:

- Tanner, R.A., Pollard, K.M., Varia, S., Evans, H.C. and Ellison, C.A. (2015), First release of a fungal classical biocontrol agent against an invasive alien weed in Europe: biology of the rust, *Puccinia komarovii* var. *glanduliferae*. Plant Pathol, 64: 1130-1139. doi:10.1111/ppa.12352 (available here: https://bsppjournals.onlinelibrary.wiley.com/doi/epdf/10.1111/ppa.12352),
- and, more recently: Ellison, CA, Pollard, KM & Varia, S (2020). Potential of a coevolved rust fungus for the management of Himalayan Balsam in the British Isles: first field releases. Weed Research 60 37 – 49 (available here: https://onlinelibrary.wiley.com/doi/epdf/10.1111/wre.12403).

There are a number of stages required prior to the release of the rust fungus biocontrol at a site. These include the following, with more detail below:

- Finding suitable sites/gaining permissions
- Collecting ripe seeds before drying and sending these to CABI
- CABI laboratory work to develop the biocontrol specific to the plants at the chosen site
- Training and application of the biocontrol.

Finding a suitable site:

To make use of the rust fungus biocontrol, firstly suitable sites need to be found that have high humidity, receive a good amount of sunshine during the day, and are not inundated for long periods/frequently washed out. Landowner permissions need to be sought, along with any permissions from Natural England (e.g. for designated sites) and the Environment Agency. The landowner also needs to be aware that a 10x10m area of Himalayan Balsam will need to be left intact for the rust fungus to infect. Normal Himalayan Balsam management can take place outside of this area. Community involvement is also encouraged, where possible.

Seed collection for CABI:

Next, come September, 200+ ripe, black seeds need to be collected from the selected site, from a range of the plants present. The seeds are collected by carefully placing a bag over the seed pods then shaking/gently squeezing to explode the pods, releasing the seed into the bag. Anyone who has touched a ripe seed pod will know these seeds fire out at all angles! These black seeds need to be laid out to dry on a tray for several days, until they turn grey-ish, separated by time and space from any other samples collected. Once dry, the seeds are packaged up with a unique identification, grid reference, date collected etc. and sent to the CABI team in Surrey.

Developing the biocontrol:

Over winter, the CABI team stratify the seeds, then, between January and June, they grow the seedlings on and attempt to match one of the rust fungus strains to the particular biotype of Himalayan Balsam received. It would appear that Himalayan Balsam has been introduced to the UK on multiple occasions and from a variety of sources, and the biotypes can differ based on where in Asia the Himalayan Balsam originated when it was first imported. The co-evolved rust fungus strains are so specific, that sometimes there is no match between host and biocontrol, and the host plants may be resistant to the rust fungus.

Application of the biocontrol:

If a successful match is obtained, CABI will then develop enough inoculum hand-spray for the chosen site, to treat a 3 x 3m area within the 10 x 10m selected patch. The CABI team will train the project leader on the best practice and method for inoculation. This usually involves using a small hand-held sprayer and spraying the underside of leaves in the evening/straight after rainfall, when it is cooler and more humid. The application takes

Himalayan Balsam seed collection, Pant Glas

Footpath to Rhosfach above Pant Glas - Himalayan Balsam

place three times over the course of the summer. Monitoring includes temperature and humidity measurements, along with infection assessments. The rust fungus should survive in the leaf litter and re-infect the site and beyond the following year, but if the rust fungus does not seem to have survived the winter at that site, a further spray application is included through CABI's offer. The costs of this biocontrol is being funded by the SINNSI project at specific sites in Shropshire.

Helping pollinators and native flora:

Beekeepers are often concerned by the removal of this useful late-summer honeybee forage, but should be reassured that CABI state that pollinators will not be affected by this rust fungus, as it is so species-specific, and that the rust fungus acts quite gradually, allowing native flora to recolonise the site naturally. For the SINNSI project, we will also investigate re-seeding bare sites with local provenance seed mixes/seed mats, including wildflowers, to help reduce bank erosion and restore native habitat and nectar/pollen sources.

Himalayan Balsam, Pant Glas

Anyone with a garden/outdoor space can help support bees and other pollinators by planting more suitable nectar and pollen-rich species. Some great examples are listed in the Ribble Rivers Trust/Bumblebee Conservation Trust leaflet on Managing Himalayan Balsam & Conserving Bees, available here: https://ribbletrust.org.uk/wp-content/uploads/2015/01/Himalayan-balsam-and-BeesC.pdf

Get involved:

If you are part of a local group that tackle invasive non-native species, and would like help with advertising your sessions to bolster volunteer help in 2021, do get in touch with Kirsty via InvasiveSpecies@ShropshireWildlifeTrust.org.uk . You can join Shropshire Wildlife Trust as a member to help support the continuation this kind of work (see: https://www.shropshirewildlifetrust.org.uk/join), and you can follow the SWT Rivers team on social media, where we will provide updates on this project from time to time, via:

- Facebook (https://www.facebook.com/LYMag7/),
- Twitter (https://twitter.com/LYR_Shropshire)
- and Instagram (https://www.instagram.com/lyr_shropshire/).

Kirsty Brown, kirstyb@shropshirewildlifetrust.org.uk

The Ferns – An ID Guide. Part 3 (Polypodies) *Polypodium*

Martin Godfrey

Our rather odd year has made much outdoor botanising, especially if it involves travel, rather problematic, with little sign of an early respite. Because of this I have decided to do part 3 of this guide on the genus *Polypodium.* There are usually plenty of plants to be found and as a genus it is pretty easy to identify but with plenty of challenge in getting accurate species IDs. There is also another species which is sufficiently similar to trap the novice. So go out and collect a few fronds and you will have an interesting project for the long winter evenings.

For the budding fern grower *P. vulgare* does grow quite well from spores too – I haven't tried the other two species.

Introduction

The text below assumes that you have read part 1 of the series where various terms, growth forms and so on were introduced.

There are three species of *Polypodium* found in Britain – *P. vulgare, P. interjectum* and *P. cambricum.* The first is common and abundant in Shropshire and the second, too, is quite frequent but *P. cambricum* has only a few older records so is well worth hunting down as it does occur in adjacent counties. Those of you who saw my article on fern hybrids won't be surprised to hear that the species in this genus hybridise. In fact the hybrid between *P. vulgare* and *P. interjectum, P. x mantonii*, can be more abundant than either parent.

All 3 species grow from creeping rhizomes which grow on, or just below, the surface of the substrate – which may be soil, rock or trees. Growth from a creeping rhizome produces a straggling colony rather than the neat "shuttlecocks" found in many fern species. The rhizomes put up individual once-pinnate fronds from the tip which mature and produce sori on their undersides – the sori being naked, that is, without indusia. The shape and, to a degree, the colour of the sori can be a useful ID feature. The individual fronds have pointed tips and truncate bases with quite long wiry stipes, and have features which can help with ID.

As you will see in the individual species accounts below the three species have macroscopic morphological and ecological characteristics which differentiate them – however in practice they are very variable and it can be difficult to have confidence in a field ID. Microscopic features are introduced which are far less variable and usually allow a confident ID to species.

Polypodium vulgare

This is the commonest of our three species. It favours rather acid conditions, growing on old walls, earth banks and trees with acid bark – eg *Quercus.* The individual fronds can be 30-40 cm long and are typically quite narrow and, except for the top few cm, more or less parallel sided. The individual pinnae are usually bluntly tipped. (Fig 1) That said some plants, and sometimes even individual fronds, can vary significantly from the

Fig 1. *Polypodium vulgare*

Fig 2. Round sori

"standard" shape and may even look very like one of the other two species. Somewhat more reliable are the sori – which are typically round in this species and are bright golden yellow fading to a dark brown (Fig 2). Before the sori begin to darken it is often possible to see the row of thickened cells as a thin dark line on the backs of individual sporangia (the annulus) with a x10 lens. The annulus is far less conspicuous (and usually smaller) on the other two species.

Polypodium interjectum

A quite abundant and common species, *P. interjectum* grows on similar substrates to the former species but favouring rather more basic conditions – it can be quite abundant, for example, on the bark of Elder *Sambucus nigra*. The individual fronds can be up to 30cm long and have a rather narrowly elliptical outline, with the lower pinnae somewhat shorter than those further up. The tips of the pinnae are usually pointed and the margins can be somewhat toothed (Fig 3) – in very large specimens the toothing can be quite marked. Again the individual plants can be very variable making field ID problematic. Indeed the illustrative specimen in Fig 4 is a bit non-standard.

Fig 3. Pinnae with toothed margins and elliptical sori.

Fig 4. *Polypodium interjectum*

The sori in this species are usually elliptical and grow from green to light yellow ending up rusty brown, as in Fig 3. It is often possible to spot the annulus as a short dark line on the sporangium in the yellow stage of development but it is shorter and much paler than in *P. vulgare*. The sori can be quite variable in shape, even on the same frond, so they should be examined carefully to ensure that they are in fact elliptical. Fig 5 is *P interjectum* but has rather variable sori.

Fig. 5 Variable sori.

Polypodium cambricum

This species is scarcer than the other two, being confined rather more to the south and west of Britain but is more widespread in Ireland. It grows on similar substrate types to the other two but has a preference for a higher pH, often being found on limestone or the mortar of old walls. The individual fronds can be up to 30 cm long and have a markedly broad elliptical outline – Fig 6. In my experience the frond shape is rather less variable than in the other two species – the problem here being that both

Fig 6. *Polypodium cambricum*

P. vulgare and *P. interjectum* can sometimes show this broad elliptical frond form. As in *P. interjectum* the individual pinnae usually have a pointed tip and may have serrated margins (Fig 3).

The sori in this species are usually elliptical and have the same sort of colour progress as *P. interjectum* – they can also be similarly variable. It isn't usually possible to see the developing annulus in this species.

Microscopy

It will be apparent from the above brief descriptions that these species can be quite variable and thus difficult to confidently identify in the field. There are however some good, reliable, microscopy features which will distinguish the three – the only caveat being that they need to have sori at the yellow or brown stage.

The features used for identification will use characters from the sporangia and sori so you will need to collect a frond or a few pinnae with fresh-looking yellow or brown sori. Scrape an individual sorus off the pinna into a drop of water on a microscope slide and make sure that it breaks up and disperses in the water; you may need a little washing up liquid in the water to help dispersal. Put on a cover slip and examine under a medium magnification 100x–200x is fine.

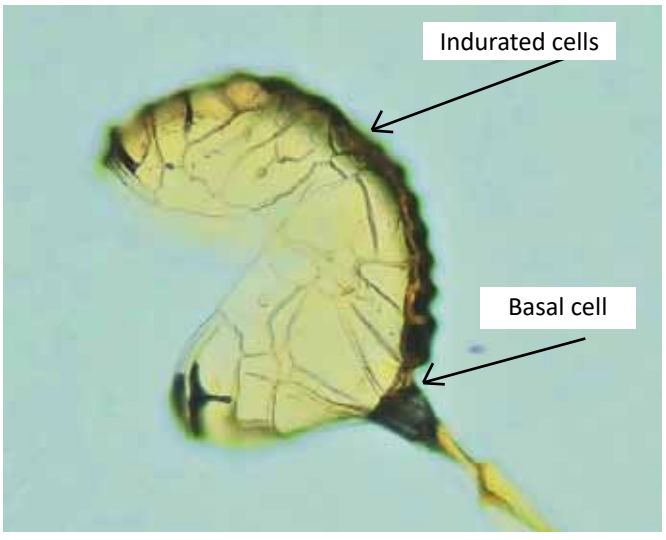


Fig. 7. *P. vulgare* sporangium

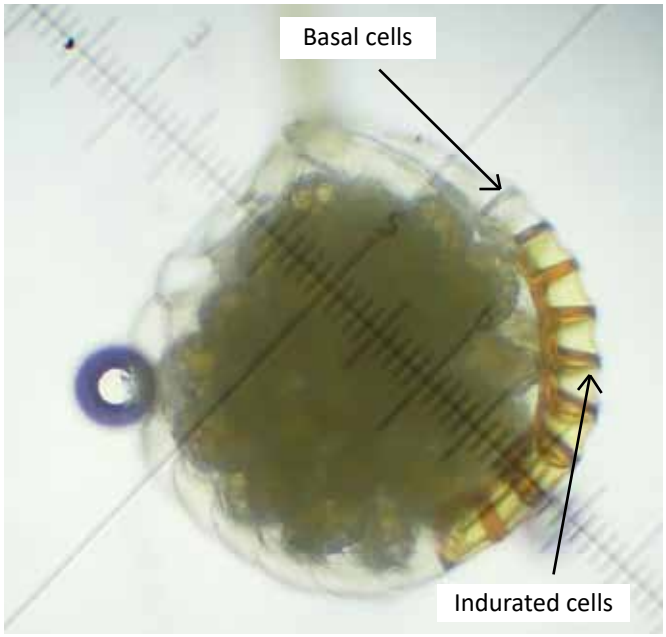


Fig. 8. *P. interjectum* sporangium

Polypodium vulgare. In this species there are around 10–15 indurated (thickened) cells on the back of the sporangium and just one thin-walled basal cell below them (Fig 7).

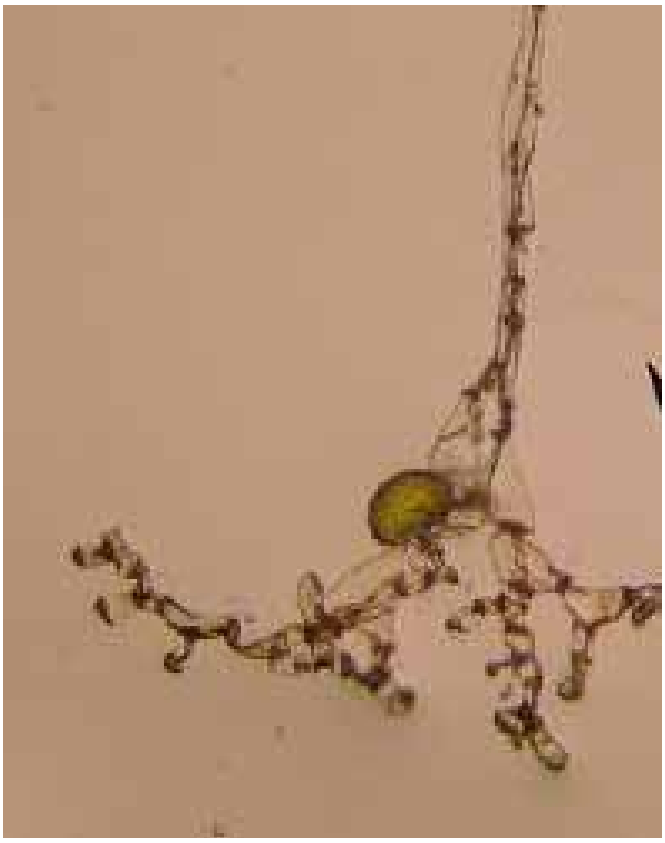


Fig 9. Paraphyses in *P. cambricum.*

Polypodium interjectum has around 7–10 indurated cells and usually 2 quite large basal cells, there is no real overlap with *P. vulgare.* Fig 8.

Polypodium cambricum has a similar pattern of cells in its sporangia to *P. interjectum* with quite a bit of overlap in indurated and basal cell numbers (typically around 5 – 10 indurated cells and around (2) 3 basal). This makes the identification confirmation using sporangia unreliable. Instead we look for paraphyses amongst the sporangia on our slide – these are fine branched "hairs" which do not occur in the other two species (Fig 9.).

A potential confusion species

A possible confusion species for the novice is *Struthioperis spicant* (formerly *Blechnum*) which is also once-pinnate and looks a bit like *Polypodium*. However this plant grows in neat compact tufts and, later in the year, produces leaves with a long, slender, shape which have linear sori on their undersurfaces, Fig 10 and 11. Also note that, unlike *Polypodium, Struthiopteris* leaves taper downwards to their base giving them a long narrow elliptical profile with a very short stipe.

Fig 10. *Struthiopteris spicant*

Fig 11. Underside of a *S. spicant* fertile frond showing sporangia

Caring for God's Acre

Liam Taylor

Introduction

I offer a further update on behalf of Caring for God's Acre, a Shropshire based conservation charity whom you are hopefully acquainted with by now. In autumn 2019 I wrote about the recording that had taken place over the preceding months. This spring I wrote an update which included some maps and a list of unrecorded churchyards in Shropshire.

As I did previously, I offer a disclaimer – apologies if I miss anyone off, I have various lists and emails to check to remind me of who has submitted what and when. In addition, I only list the records we at Caring for God's Acre have been made aware of via email or iRecord etc. In this update I have tried to pick out species which might be interesting or unusual. Unfortunately, I am not a very accomplished botanist so you will have to excuse me if I point something out and you think "So?".

Recording in 2020

2020 has provided opportunities and challenges for recording in burial grounds. Churchyards that are usually mowed with fervent regularity were allowed to grow their hair out for a change. Scores of lawnmowers laid dormant in garages, their owners looking wistfully out of their windows remembering better days when they were able to 'keep on top' of the grass. Just think of all those dandelions…

A perfect opportunity for recorders to finally see what treasures these sites were hiding. Well, it didn't quite work out like that. Whilst some recorders were able to visit burial grounds as part of exercise allowances, that wasn't feasible for many people. Since restrictions were eased, it has been easier for many to visit burial grounds again, but many of us are still far from usual routines and activities. Of course, most mowing regimes are back in full swing as well now.

January: Vicky Barnes was birding in Hope Bagot and Worfield churchyards, where she managed a spot of winter botany as well. Dan Wrench was looking at Yew trees in St Giles, Shrewsbury where he found a gall that grows on Yew trees, *Taxomyia taxi.*

February: Peter Johnston managed a double header of Clun and Clunbury churchyards.

March: Brenda Dyson was recording in St Mary's church in the charming village of Bucknell, and both

Harriet Carty and Peter Johnston shared records from Caynham churchyard – I hear it is well worth a visit.

May: Isabel Carter was at Smethcott churchyard recording birds (House Martin, Sparrowhawk, Spotted flycatcher, Swallow), mammals, invertebrates, and trees. Michael Carter completed a hat-trick of surveys this year, Leebotwood: St Mary, Woolstaston: St Michael and All Angels, and Smethcott: St Michael. Smethcott was something of a write off straight away, mown like a billiard table. Leebotwood and Woolstaston both held promise however. Michael made more visits in May, and July, and unfortunately, both churchyards got mown. These are the challenges we are up against unfortunately. It can take a tremendous amount of effort and persuasion to change management regimes. Nonetheless, it can happen and often it comes off the back of an enthusiastic individual taking an interest in a site.

June: Andrew Perry was recording in St Andrew's church in Church Aston, Newport. There he found Walnut, Hop Trefoil, and Rat's-tail Fescue. Sandra Spence was in Hopesay, giving this charming churchyard some more attention – a site appreciated by many as far as I can tell. John Handley had recently discovered that Holy Trinity, Coalbrookdale was the burial place of Abraham Darby IV and his wife Matilda, and duly paid it a visit. There he found Heath False-brome *Brachypodium pinnatum*, which has also been found in Shrewsbury Cemetery and perhaps adds credence to a theory that it has been brought in with limestone chippings. John has written a lovely piece on his visit to the churchyard, well worth a read.

July started with some photos of Bicton churchyard from Andrew Law, who informs me that this site is being mown less frequently with more plants flowering and occasional waxcaps popping up. Later in the month Rob Rowe visited Buildwas churchyard and recorded a respectable 60 species, with Black Horehound and Spring Sedge. Rob also visited St Edith's Church, Eaton Under Heywood, 117 species recorded.

August: Caynham gets another visit! Some churchyards get all the fuss don't they? This time it was Rob Rowe visiting.

Summary

Thanks to all those who have shared their records. Perhaps I can provide another Spring update with maps and lists if there is a call for it. By the spring, the Lichfield and Hereford dioceses will be up on our burial grounds portal on the NBN Atlas, so that might provide further summary opportunities as well. If you haven't yet looked at our burial grounds portal – search google for burial grounds portal nbn, and the first result should be correct.

In other news, I recently produced a film for the Restoring Shropshire's Verges Project. A worthy endeavour, hopefully just one of many more projects to come. The video is on the Caring for God's Acre YouTube page if you would like to take a look.

Liam Taylor, October 2020. liam@cfga.org.uk

Michael Carter was frustrated to find Leebotwood: St Mary had been mowed by the time of his second visit

Holy Trinity Church in Coalbrookdale: *Bromopsis erectus* and *Brachypodium pinnatum*

John Handley

After surveying a site, more often than not, I come away with a half-formed question, and I thought I'd share my findings after surveying the churchyard of Holy Trinity Church in Coalbrookdale, in the hope that somebody may be able to provide an answer to my question.

I had spent the day working locally and thought I'd call into the Churchyard and make some records. It was a sunny end to an enjoyable day and I'd wanted to visit this churchyard after it came to my attention as the burial place of Abraham Darby IV and his wife Matilda, both notable individuals within Ironbridge. With a peal of ten bells, it is an imposing church set within the beautiful wooded valley of Coalbrookdale.

As I approached the metal gate set within the wall to the east of the church I fell into conversation with the Churchwarden, Mrs Darlington. She was diligently cleaning a set of steep steps and graciously allowed me to enter the churchyard. I learned that she had woken that morning to the realisation that she would have been married in this Church 56 years ago, that very day. She explained that her husband wasn't alive anymore; I later learned that there is a memorial to him within the churchyard. Mrs Darlington was born at the Wharf in Ironbridge and Holy Trinity Church has evidently played a significant role within her life. I saw her several times, in passing, over the next few days, each time she was engaged in conversation with various neighbours and appeared to have time for everyone. This led me to contemplate community and serving the communities in which we live or where we encounter them, such as online communities, which have recently become more significant within my own life, and I imagine for many others too.

I surveyed the churchyard and recorded 112 species, the two that were the most remarkable were Upright Brome *Bromopsis erecta* (syn. *Bromus erectus*) and Heath False-brome *Brachypodium pinnatum* (previously Tor-grass). This was the first time that I'd seen Upright Brome and after keying it through successfully I also collected a specimen which is currently in my press. There were a dozen plants distributed alongside a path in the south-east of the churchyard, all going to seed and thriving despite the shade provided by the canopy of Yew trees.

Bromopsis erecta – Upright Brome

Although not regarded as one of the rare Bromes within Shropshire, it is not a common species. The BRC (Biological Records Centre, 2020) comments that it is 'a tufted winter-green perennial grass of dry, relatively infertile calcareous soils, growing in ungrazed or undergrazed chalk and limestone grasslands, where it often forms dense stands with *Brachypodium pinnatum*. It also occurs on calcareous sand dunes, roadside banks, quarry spoil and occasionally waste ground, but avoids wet or arable sites. It spreads by seed. Lowland.'

The recent Shropshire Flora (Lockton & Whild, 2015) states that it is an axiophyte occurring within meadows and limestone quarries (figure 1). 'Usually in Species-rich calcareous grassland such as CG2 *Avenula pubescens* in Ballstone Quarry, Jones's Rough and Windmill Hill; CG3 *Bromopsis erecta* at Ballstone Quarry, on the rock outcrops at Ippikin's Rock, in Lea and Lilleshall quarries, on Moelydd, at Stokes's Barn and the Foxholes; in CG7 *Thymus polytrichus* on limestone exposures at Presthope; MG1c *Filipendula ulmaria* on a hedgebank at the Speller and in MG5 *Festuca rubra* at Stretton Westwood and Treflach.

The Ecological Flora of the Shropshire Region (Sinker, *et al.*, 1991) provokes my curiosity declaring that 'the small hedged fields of Llynclys Hill and neighbouring parts of the Oswestry uplands are as rich as any limestone pastures in the Midlands or the Welsh Marches. One of their surprising, and perhaps significant, features is the virtual absence of the major calcicole grass species found on other parts of Britain. Upright brome is rare in the Oswestry district while tor-grass, crested hair-grass,

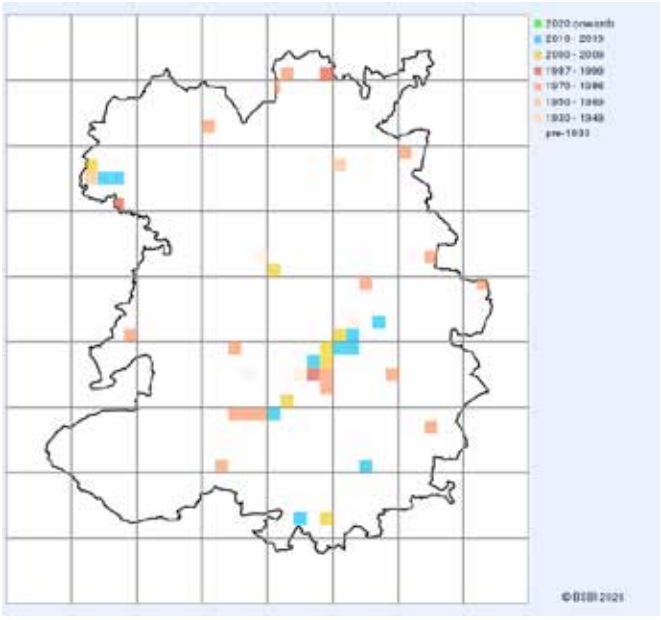


Figure 1. Distribution of *Bromopsis erecta* within Shropshire (BSBI, 2020).

meadow oat-grass and blue moor-grass are completely missing from the grasslands of this region. Red fescue and quaking-grass take their place, with spring sedge and glaucous sedge.' It certainly seems to run out of steam when it gets to Shropshire (Figure 2).

Brachypodium pinnatum – Heath False-brome

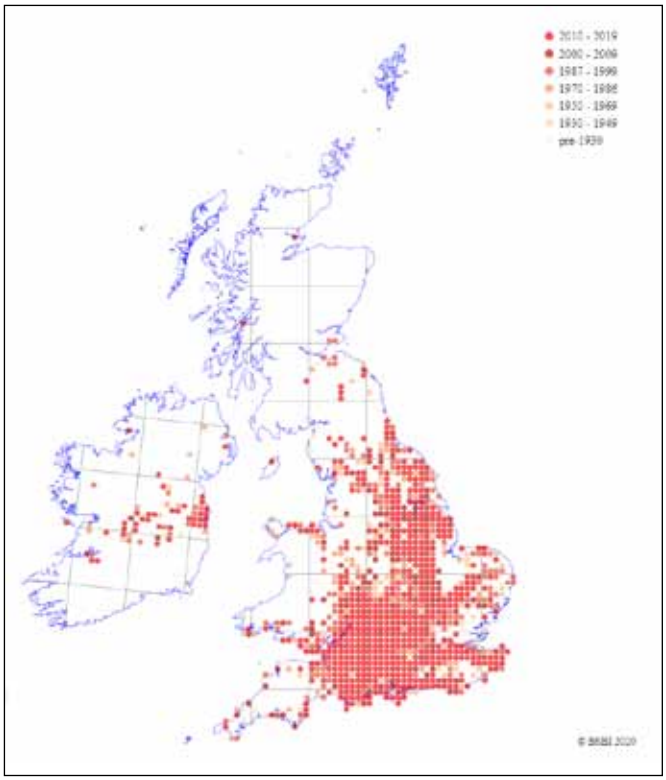


Figure 2. Distribution of *Bromopsis erecta* within Britain and Ireland (BSBI, 2020).

Until recently, there were only two species of *Brachypodium* recognised amongst the native flora of Britain and Ireland: False Brome, *B. sylvaticum*, and Heath False-brome, *B. pinnatum*. In the second edition of Stace (1997), *B. rupestre* is mentioned in Other spp., as "reported in 1991 but requiring confirmation and close to *B. pinnatum*". The third edition (2010) includes *B. rupestre* as a third native species.

Rather confusingly *Brachypodium rupestre* has been assigned the vernacular name Tor-grass and the split recognises *B. pinnatum* as Heath False-brome. *Brachypodium rupestre* is native and often dominant in grassland on chalk and limestone. Whereas *B. pinnatum* is native in grassland, scrub, open woodland and marginal habitats, often on clay. The distribution of each species is currently unknown, since all records have previously been ascribed to *B. pinnatum*.

Brachypodium pinnatum has flat leaves when fresh, with minute prickle-hairs (≤30µm) between and over the veins on the lower side (microscope recommended). The raceme is usually slightly pendent and the spikelets are usually hairy. *B. rupestre* has leaves usually inrolled even when fresh, without minute prickle-hairs between the veins on the lower side. The raceme is usually stiffly erect and spikelets are usually glabrous.

In practice, distinguishing these taxa is relatively difficult as *B. rupestre* can have hairy spikelets and variable amounts of prickle hairs between the ribs, even within the same colony, (Stace, 2019).

Tom Cope the author of the new BSBI Grasses Handbook (Cope & Gray, 2009) is sceptical about distinguishing these taxa at species level, saying that 'there is general agreement that the morphological characters, both qualitative and quantitative, overlap to the point where they cease to be of much practical value' concluding that 'there is more work to determine whether a distinction is both practicable and useful.' (Amphlett, 2011).

Brachypodium pinnatum spreads mainly by means of extensive creeping rhizomes, and can form dense stands often creating a thick layer of persistent leaf litter. Within chalk grasslands that are renowned for their species-rich swards, and associated invertebrate faunas, it is often considered an invasive weed. It became more firmly established in these areas following changes in grazing practice and the advent of myxomatosis, sheep and rabbits having formerly held the grass in check. Although vegetatively vigorous, seed set is poor and variable, averaging around 20% at best. Where viable seed is produced it is shed from September onwards though some may overwinter on the plant. Seeds

Date	Recorder	Determiner	Location	GR	Comment
1983	Blunt, A.G.	Trueman, I.C.;Benoit, P.M.	Vane Coppice	SJ674051	Roadbank.
1990	Bingham, J.		Clee Hill	SO601749	A few plants on the steep, south-facing slopes of old limestone workings.
2013-06-29	Evans, D.J.		Shrewsbury Cemetery	SJ4811	Abundant in the cemetery.
2013-06-30	Duffell, M.S.		Shrewsbury Cemetery	SJ488113	Abundant in the cemetery, growing through the limestone chippings.

Table 1. Records of *Brachypodium pinnatum* within Shropshire.

germinate in spring and appear not to form a persistent seedbank (Cope & Gray, 2009).

Within Shropshire it is regarded as a rare plant (Lockton & Whild, 2005), having only been recorded at three sites (table 1). I was fortunate to see it growing at Shrewsbury Cemetery in June 2019, doing remarkably well and occupying over a hundred square metres of the Cemetery. But I was very surprised to see it at Coalbrookdale 'amongst and growing on several graves within short mown turf, 10 square metres.' Although perhaps I shouldn't have been, as this is less than a kilometre from where it was initially found by Godfrey Blunt in 1983.

The entry for *Brachypodium pinnatum* within the Ecological Flora (Sinker, *et al.*, 1991) reiterates that a 'curious feature of the limestone grasslands in this region is the rarity or absence of most of the characteristic species of most of the calcicolous grasses found in similar habitats elsewhere in the British Isles. *Bromopsis erectus* is on the edge of its range, becoming very rare in the Oswestry uplands; *Brachypodium pinnatum* only occurs as a casual here; *Sesleria albicans* has its main area of distribution well to the north. The most surprising gaps, however, are those in the ranges of *Avenula pratensis* and *Koeleria micrantha*, neither of which should be climatically excluded.' The distribution map appears to support this statement (figure 3), with the distribution of both species conspicuously avoiding Shropshire.

Back to that half-formed question that occurred after

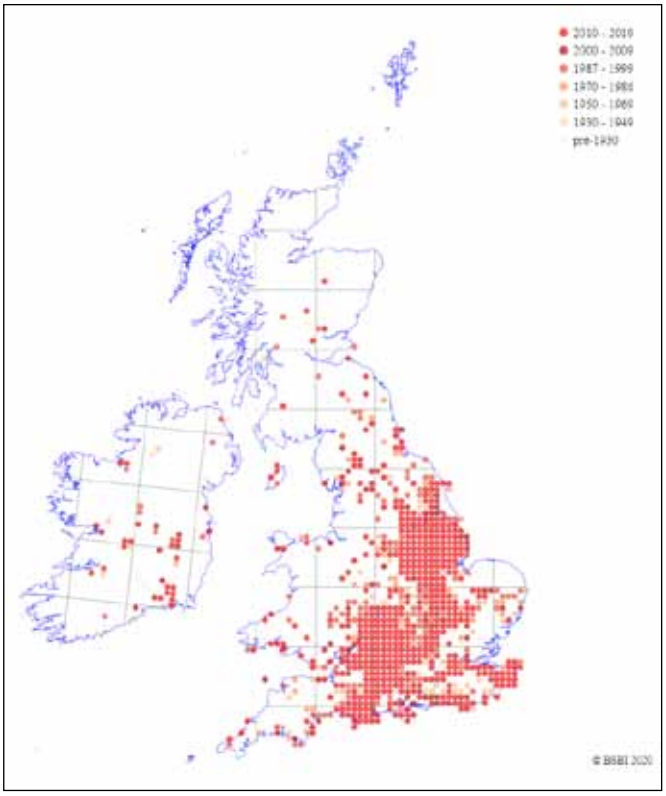


Figure 3. The distribution of *Brachypodium pinnatum* s.l. within Britain and Ireland (BSBI, 2020).

I'd finished recording the Churchyard. The records for *Brachypodium pinnatum* seem to show that limestone chippings are a common substrate for this species. Cemeteries and churchyards appear to offer this species a useful habitat. Why? The management within the cemetery at Shrewsbury and the churchyard in Coalbrookdale are different. How did it appear in the two burial grounds? Is it being carried, and potentially distributed, on mowers? Or possibly through limestone chippings on the graves? But the question that has emerged through writing this article is why is there such a conspicuous absence of calcicolous grasses on suitable geology within Shropshire?

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Addendum: I collected specimens of *Brachypodium pinnatum* from both of the sites, the cemetery at Shrewsbury and the churchyard at Coalbrookdale and sent them away to Michael Wilcox for verification but unfortunately neither were conclusive. Michael states that ongoing studies in Spain are trying to establish if these are two species, although Covid 19 has halted much of that work this year.